ROBERT F.
KENNEDY
MEDICAL CENTER

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Dear Dr. Werdegar:

Robert F. Kennedy Medical Center ("RFKMC") was included in the second study and published report of risk-adjusted measures of outcomes conducted by OSHPD in response to Assembly Bill 524. For RFKMC, the study focused on procedure outcomes for acute myocardial infarction ("AMI"). OSHPD will publish a new rating scale as well as a graphic representation of each facility's rating. In response to that published report, a study was undertaken by RFKMC to evaluate the AMI results as reported by OSHPD.

RFKMC had mixed results in the OSHPD report. While the AMI mortality rate for Model A was acceptable, RFKMC's experience was higher than predicted in Model B of the OSHPD study. Our study found:

- **When highly specific clinical data was used to predict RFKMC's AMI mortality rate with alternative prognostic models for both Models A and B of the OSHPD study, RFKMC performed better than predicted for both models.**
- **All "unexpected" deaths attributed to RFKMC by OSHPD's model were accounted for by dividing the cases into two groups (very high risk and all other), based upon APACHE II scores or having been resuscitated just prior to admission.**

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The use of predicted mortality rates as standards was done to comply with AB 524's requirement that the outcome data be "risk adjusted". The intent of risk adjustment is to compensate for the fact that hospitals which differ in the mix or acuity of patients treated would be expected to have different rates of adverse outcomes. However, the technique of risk adjustment is controversial.

It is argued that statistical risk adjustment is a poor substitute for randomization which is the scientific method used to control patient differences in clinical trials. Even among those who accept the use of risk adjustment in outcomes research there is serious doubt about whether hospital discharge data are adequate for this purpose.[1] [2] In particular, discharge abstracts contain only limited clinical data. These records include a list of diagnoses, but do not include lab values, vital signs, or other indicators of severity of illness. Furthermore, there are many ambiguities, as diagnostic coding is not an exact science, and is not uniformly performed nor accurate across hospitals. Choosing among coding options greatly impacts the predicted mortality rate assigned by OSHPD.

Specific to our hospital, reabstraction of RFKMC's AMI patients records revealed the presence of secondary diagnoses (comorbidities) that were not listed on the original abstracts. **The risk factors that depended on these secondary diagnoses were therefore under-counted when OSHPD calculated the predicted mortality rates.** These factors included diabetes, CHF, acute renal failure, hypertension, pulmonary edema, ventricular tachycardia, hypotension, hyperosmolality, and late effects of cerebrovascular disease. Type of admission was also under-coded, particularly with respect to emergent admissions which were frequently classified as urgent.

The many secondary diagnoses present are reflective of the severity of illness of the RFKMC patient population. APACHE II is widely used by hospitals as a severity of illness measure. The APACHE II score takes into account the degree of physiologic impairment across a wide spectrum of indicators as well as the patient's age and chronic conditions.[3] RFKMC patients with low APACHE II scores had a mortality rate that was below OSHPD's Model A prediction. RFKMC patients with high APACHE II scores had a poor prognosis and their mortality rates

were substantially higher than OSHPD predicted.

As discussed, the OSHPD model is based on data that lacks clinical specificity. Alternative prognostic models are available, as a result of clinical investigations reported in the literature. A study by Selker et al.[4] used clinical data from the initial ECG, respiratory rate and blood pressure collected in the ER to develop a prognostic model of inpatient mortality following AMI. As with the 1993 report, when Selker's methodology was applied to RFKMC patient data, RFKMC performed well within the predicted mortality rate. This suggests that the mortality rate for the AMI admissions at RFKMC was predictable given accurate physiological data on these patients.

Finally, as additional indicators of clinical severity of illness, we analyzed mortality in relation to very low mean arterial blood pressure, coma, and elevated white blood count. It was found that patients whose health status upon arrival at RFKMC was seriously impaired as reflected by these additional measures had elevated mortality rates which OSHPD's predictions failed to adequately account for as risk factors in either Model A or B. This suggests that supplemental clinical data would be necessary to create a model that could accurately predict mortality rates in groups of AMI patients.

Mortality following an AMI depends upon factors some of which are accounted for by OSHPD's model, but many of which are not. The chief limitation is the lack of clinical data. The prognosis of AMI patients cannot be accurately estimated without employing additional data, such as lab values, vital signs, and ECG data. The results of our study confirm that data consisting solely of demographics and a list of coded diagnoses is insufficient for prognostic modeling in AMI. **When highly specific clinical data was used to predict RFKMC's mortality rate with a prognostic model developed by Selker et al, RFKMC performed better than predicted.**
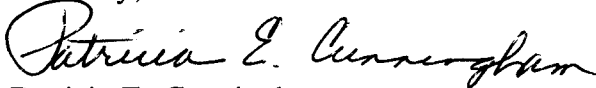
RFKMC supports the intent of AB 524 to provide patients and payors with information as to quality measures among hospitals, as well as to assist hospitals in quality improvement.

However, data and statistics that do not fully account for all aspects of the patients' condition prior to and upon admission, patients' treatment, and treatment outcome, are both misleading and damaging.

We suggest that OSHPD include medical record numbers on the data set in future studies to assist hospitals in record retrieval. In addition, it would be helpful if OSHPD offered workshops earlier in the 60 day hospital review period.

We respect the efforts being made by OSHPD, and hope that future studies will more fully reflect the acuity of patients being treated, as well as the quality of care being provided, at Robert F. Kennedy Medical Center.

Sincerely,

Patricia E. Cunningham
President and Chief Executive Officer
Robert F. Kennedy Medical Center

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2. Green, J., Passman, LJ., Wintfeld, N. Analyzing hospital mortality: the consequences of diversity in patient mix. JAMA. 1991; 265: 1849-1853.

3. Knaus, WA., Draper, E. Wagner, DP., Zimmerman, JE., APACHE II: A severity of disease classification system. Critical Care Me. 1985; 13:818-829.

4. Selker, HP., Griffith, JL., and D'Agostino, RB., "A time-insensitive predictive instrument for acute myocardial infarction mortality: a multicenter study." Medical Care 1991; 29: 1196-1211